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Clinical Presentation and Spectrum of Involvement of Rotator Cuff Tendon and Its Associated Pathologies

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Abstract
Background: *Rotator cuff tendon tear is very common problem and its frequency is found to be increasing. It is characterized by immense pain, weakness, stiffness which is the outcome of tendon tears. It's also known as tendinopathy. Various data's are available on RCT which can help to understand the tendinopathies and associated pathologies.*
Aim: *Purpose of this descriptive study is to study the Clinical presentation and spectrum of involvement of rotator cuff tendon and its associated pathologies*
Material and Method: *Patients referred to the Department of Radio diagnosis, Rural medical college, Pravara Institute of Medical Sciences, Loni, for MRI shoulder with suspected shoulder pathology were examined. 70 patients aged above 18 years with Rotator cuff lesions were detected on magnetic resonance imaging of the shoulder joint and were selected for the study.*
Result: *The most frequent presenting complaint in patients with rotator cuff disease was pain in 57% cases followed by stiffness resulting in reduced range of movement across the shoulder joint. The most commonly affected tendon is the supraspinatus tendon in 81% cases .The least frequently affected tendon being the teres minor.*
Conclusion: *Rotator cuff disorders occur both in male and female with no gender predisposition. It is a common contributing factor of shoulder pain. A detailed knowledge on the same can help to reduce the discomfort caused.*
Keywords: *Rotatory cuff, tendon, tear, shoulder joint, pain.*

Introduction

The shoulder joint is multiaxial with a wide range of movements provided at the cost of skeletal stability. Shoulder joint pain is considered to be the third most common skeletal pain.[1] Rotator cuff tendons impingement or subdeltoid bursa, bicipital tendonitis, frozen shoulder, and glenohumeral, and acromioclavicular arthritis are some of the most frequently diagnosed shoulder problems.[2] Rotator cuff tears are more common and has a prevalence rate of 26%.[3]rotatory cuff lesions are often associated with severe pain, stiffness, functional disability which all together leads to a compromised life quality and patients have to depend on others for their basic needs.[4,5] According to the data available the expected reason for the tear of rotatory cuffs could be due to chronic degeneration. The rotator cuff tear can be of either partial thickness or full thickness.[6,7] Milgrom C et al recommended that hand

dominance, occupation and leisure activities have a limited influence on the timing of onset and rate of progression of mature atraumatic tendon degeneration.[8] However the location and size of the rotator tear can have great impact on diagnosis and treatment outcome.[9] Diagnosis of tendinopathy has a very important role to play only with the accurate diagnosis patients suffering can be minimized. There comes the role of magnetic resonance imaging. MRI has good spatial resolution for assessment of soft tissue, to identify tendon edema & tear in the muscle cuff. Rotator cuff lesions are common yet complex in nature which can have a severe impact on patient's life so, the purpose of present study was to study the clinical presentation and spectrum of involvement of rotatory cuff tendon and its associated pathologies.

Material and Method

70 patients aged between above 18 attending Department of Radiodiagnosis, Rural medical college, Pravara Institute of Medical Sciences, Loni, for MRI shoulder with suspected shoulder pathology were included in the study. Ethical clearance was obtained. Patients were explained regarding the procedures to be performed and treatment. Written informed consent was obtained from patients/guardians.

Inclusion criteria

1) Patients above 18 years of age,
2) Those with possible shoulder pathology, detected as rotator cuff tear.
3) Those willing to participate in the study

Exclusion criteria

1) Postoperative patients.
2) Known case of rotator cuff lesions on treatment.
3) Patients with contraindicated MRI
4) Medically compromised patients

Complete clinical and physical examination was carried out for all the patients. All the patients with the complaint of shoulder pain were subjected to MRI scan using 1.5 T MRI scanners. The patients were positioned in supine position with the head directed toward the scanner bore. The patient's arms rested to the side of the body and should not be placed on the abdomen to avoid transmission of respiratory motion. Patients were than examined for full thickness and partial thickness tear. Spectrum involvement and associated pathologies were recorded. Out of 70 patients included in study 38 were males and 32 females. Clinical signs reported by the patients were recorded.

Statistical Analysis

Data was collected each variable was analyzed and A *p*-value <0.05 was considered statistically significant. Data was analyzed by specific statistical software (IBMSPSS V10 STATISTICS, IBM, ARMONK, USA).

Result

The sample size for the current study was a total of 70 patients aged above 18 years. Out of 70 patients 38 (55%) male patients and 32 (45%) female patients had rotator cuff disease in this study population (Table 1).No evidence of gender predominance was seen in our study.Of the Seventy patients 46 presented with symptoms in the right side i.e. 66% and 24 patients had disease in the left side i.e.34% (Table 2). Out of 70, 40 patients with rotator cuff diseases presented with pain i.e.57%, 14/70 reported of stiffness or reduced range of movement i.e. 20%, 5/70 reported weakness of the shoulder joint i.e. 7%, inability to raise the hand over the shoulders was observed in 5 patients i.e. 7% cases and combinations of more than one complaints was observed in 6 patients i.e. 9% cases(Graph-1). Of the 70 patients 57 (81%) abnormal supraspinatus tendons were noted. Of the subscapularis tendons, 18 (25%) were pathological. Among the infraspinatus tendons, 13 (18%) were abnormal. Abnormal bicipital tendons were seen in 55 (78%). Of the tears minor tendons, 2 (3%) were abnormal accounting for the least commonly affected rotator cuff tendons (Table-3). The most frequently affected tendon being supraspinatus

and the least affected being teres minor. Of the pathologies of the supraspinatus tendon, tendinosis was seen in 10 patients (14%) partial tear in 42 (60%) and complete tear in 05 (8%). Thus, partial tear and tendinopathy are the most commonly encountered abnormalities in the Supraspinatus tendons in this study population, accounting for 60% and 14% respectively (Table-4). Among the abnormalities of subscapularis, tendinosis with no evidence of tear was noted in 3 (4%) patients, tear noted in 15 (22 %), with partial in 14 (20%) and complete in 1 (2 %) patient. Normal subscapularis tendon noted in 74 % patients. Tendinosis was found in 1(1.4%) patient, partial tear in 10 (14%) and complete tear of the infraspinatus tendon in 2 (3%) patients. Rest of the patients had normal infraspinatus tendon 57 (82%). Thus the frequent, abnormality in the infraspinatus in current study group was partial tear (Table-5). Associated abnormalities in bicipital tendons were noted in 55 (78%) patients. The abnormalities seen in the tendon included tendinosis in 3 (4%) patients, fluid around the tendon with no signal abnormality in the tendon / tenosynovitis in 49 (70 %) patients and tear of the tendon in 3 (4%) patents (Table-6). Of the 70 patients there were 42 patients with partial tear of supraspinatus. Of these, the common type was the articular surface tear in 21 (50%), followed by bursal tear in 11 (26%) and the least common being the intra substance surface tear in 10 i.e. 24% (Graph-2).

Table 1: patient's demographic value

Gender	No. of patients	Percentage
Male	38	55 %
Female	32	45%

Table 2: Hand dominance of rotator cuff pathologies

Clinical symptoms in	No. of patients	Percentage
Left hand	24	34 %
Right hand	46	66 %

Graph 1- Clinical Presentation of Rotator Cuff Pathologies

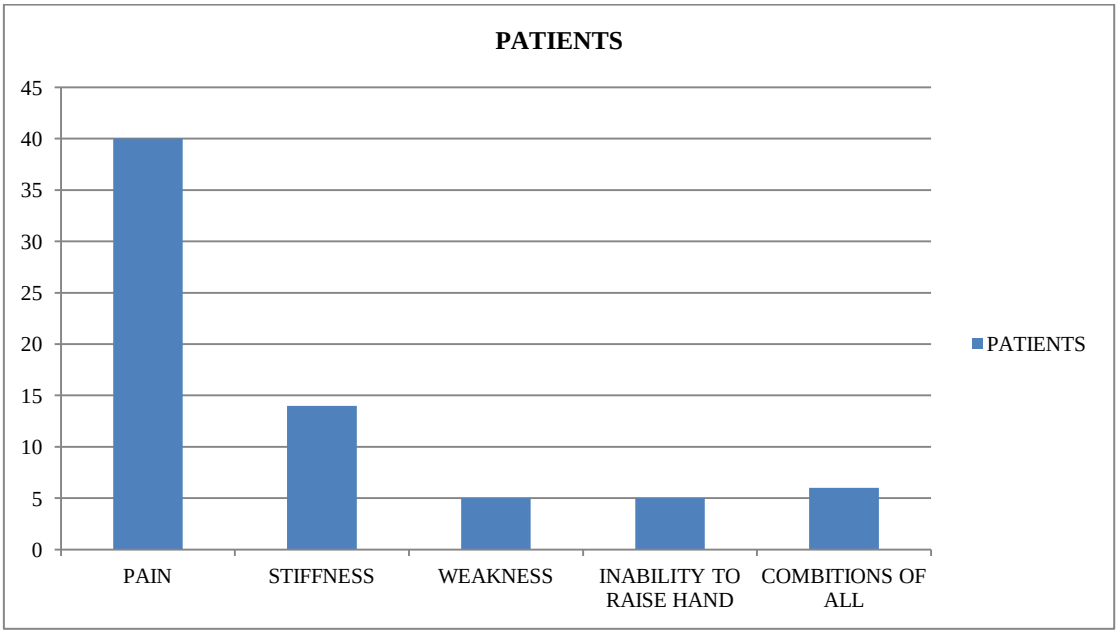


Table 3: Spectrum of Involvement of Rotator Cuff Tendons

Involved Tendon	No of patients	Percentage
Supraspinatus	57	81 %
Infraspinatus	13	18 %
Subscapularis	18	25 %
Teres minor	2	3 %
Biceps tendon	55	78 %

Table 4: Supraspinatus Tendon Pathology in Study Population

Supraspinatus pathology	No. of patients	Percentage
Normal	13	18 %
Partial tear	42	60 %
Complete tear	05	8 %
Tendinosis	10	14 %
Total patients	70	100%

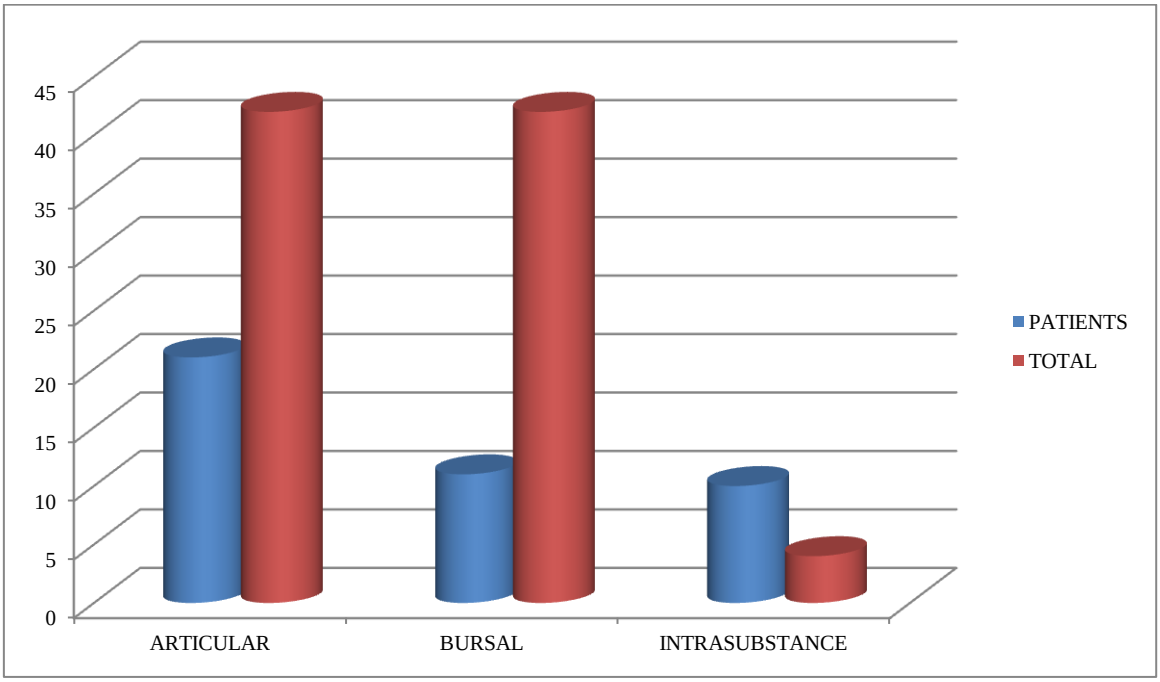
Table 5: Subscapularis and Infraspinatus Tendon Pathology in Study Population

Subscapularisand Infraspinatus pathology	No. of patients	Percentage	No. of patients	Percentage
Tendinosis	3	4 %	1	2%
Partial tear	14	20 %	10	14%
Complete tear	1	2 %	2	3%
Normal	52	74 %	57	81%
Total	70	100 %	70	100%

Table: 6 Biceps Tendon Pathology

Biceps tendon pathology	No. of patients	Percentage
Normal	15	22 %
Tenosynovitis	49	70 %
Tear / Dislocation	3	4 %
Tendinosis	3	4 %
Total	70	100 %

Graph 2- Types of Partial Tear in Supraspinatus Tendon



Discussion

Tendinopathy can be defined as an overuse condition of tendons that manifests itself as pain in and around tendons and occurs when the bodies regenerating capacity is minimized.[10,11]

Rotatorcuff tear differ in size and location. Tear less than 10 mm in size is considered as small tear, medium tears is 10–30 mm in size, and 30mm in size is considered as 'large' or 'massive' tear.[12-14] Sometimes rotator cuff lesions are asymptomatic especially in elderly patients while in some cases it is presented with different symptoms. In present study 70 patients aged above 18 years were selected 55% were males and 45% were females. However no evidence of gender predominance was seen in our study.

Which was similar to those reported by Milogram et al.[8]

Of the Seventy patients 46 presented with symptoms in the right side i.e. 66% and 24 patients had disease in the left side i.e.34%. Our study result is in favour of those reported by others.[8] Rotator cuff tears are often associated with various clinical presentations. In current study 57% patients complained of pain, 20% of stiffness or reduced movement. The most frequent complaint being pain among 40 subjects. Our results are in favour of those reported by other authors.[15,16] In current study the most frequently affected tendon being supraspinatus and the least affected being teres minor, our results are in agreement with Walz DM et al.[17] Partial tear and tendinopathy were the most commonly encountered abnormalities in the Supraspinatus tendons in this study population, accounting for 60% and 14% respectively.

Among the abnormalities of subscapularis, tendinosis with no evidence of tear was noted in 4% patients, tear noted in 22 %, with Codman had reported 3.5% involvement of the subscapularis tendon in his series of rotator cuff tears.[6] Most common abnormality in the infraspinatus in current study group was partial tear. According to the literature available massive tear is more commonly seen in subscapularis tendon and is very painful in nature.[18] Associated abnormalities in bicipital tendons were noted in 55 (78%) patients. The common abnormal finding seen in relation to the biceps tendon in a rotator cuff disease in current study group was tenosynovitis our results are similar to those reported by Zanetti M et al who also found bicipital tendinitis/ tenosynovitis to be commonly related to rotator cuff disease.[19] Beall et al in their study concluded that tears of the long head of the biceps tendon have a statistically significant association with tears of the supraspinatus and subscapularis tendons.[20]

Conclusion

Rotator cuff lesion is a complex disease which can have a huge impact on patient's life as in most of the cases it causes pain and restricted movement. Based on the result of our study pain was the most common clinical presentation noticed among people with RCT. Spectrum of involvement of rotator cuff tendon showed most commonly surpraspinatus tendon was involved. Partial tear was more common in surpraspinatus tendon.

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